Seter, David

From: Seter, David
Sent: Tuesday, April 05, 2016 9:29 AM
To: Jack.Oman@bp.com
Cc: Acree, Steven; Ball, Harold; cynthiao@wrpt.us; czimmerman@brwncald.com; dmcginnis@mcginnisandassociates.com; drdavis@blm.gov; Ford, Robert; gdavis@brwncald.com; ghatch@ypt-nsn.gov; glovato@ndep.nv.gov; Herrera, Angeles; jgardner@ndep.nv.gov; Dirscherl, Christopher; john.batchelder@bp.com; John.McMillan@CBIFederalServices.com; john@gbrw.org; ken.greene@ch2m.com; Levine, Herb; oberhydro@charter.net; Rodriguez, Dante; peters@mcginnisandassociates.com; susan@gbrw.org; tmassey@quaterra.com; stuart_brown@fmi.com
Subject: Anaconda OU1 Groundwater RAOs
Attachments: EPA Cover Letter Anaconda OU1 RAO Comments 2016 April 5.pdf; EPA S Acree Robert Ford Comments Anaconda OU1 RAOs.pdf; CB&I Comments Anaconda OU1 RAOs.pdf; YPT Comments Anaconda OU1 RAOs.pdf

Dear Jack, and Anaconda Technical Stakeholders, Please find attached EPA's cover letter response to the OU1 RAO Tech Memo plus three attached sets of comments.
EPA would like to work with you to schedule a discussion with the stakeholder group on these comments and on the next steps of the Feasibility Study process.
Thank you.
Best Regards,
Dave Seter
Remedial Project Manager
USEPA Region 9
Superfund Division (SFD-8-2)
415-972-3250

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

April 5, 2016

Jack Oman
Project Manager
Atlantic Richfield Company
4 Centerpointe Drive
La Palma, CA 90623-1066

Re: Anaconda Yerington Mine Site OU1
Comments on RAO Tech Memo

Dear Jack,

The United States Environmental Protection Agency (EPA) has completed its review, and has sought stakeholder review, of the following Anaconda OU1 (Groundwater) document: *Draft Initial Screening of Remedial Alternatives, December 2, 2015.* Thank you for producing this document which will be helpful to the development of the OU1 Feasibility Study.

EPA understands this document was primarily intended to generate discussion, therefore, we recommend a technical stakeholder conference call or meeting at which the document and EPA and stakeholder comments may be discussed. EPA has attached sets of comments from the following commenters: EPA's technical experts Steven Acree and Robert Ford; EPA's consultant CB&I; and the Yerington Paiute Tribe.

While we recommend discussion of all of the comments received, EPA would like to highlight the following for your consideration:

General Comments

1) Plume Stability. The analysis in the document will need to be supplemented. The document appears to rely on bulk analyses rather than the evaluation of well-specific temporal trends in concentrations of site-related chemicals. This type of analysis may be particularly useful for wells located near the downgradient limits of mine-impacted groundwater.

2) Technical Impracticability of Restoration. The document uses a relatively simple analytical approach to present a presumptive conclusion that groundwater restoration is impracticable. This analysis appears to be based on an evaluation of performance of the Pumpback Well System (PWS), which, incidentally, was designed for containment and not for restoration. More detailed analysis will be necessary, such as estimation of the size and configuration of a remedial system that could potentially meet the restoration remedial objective accompanied by a thorough discussion of the technical difficulties and limitations in implementing such a design, be considered to provide additional perspective.

3) Beneficial Uses of Groundwater and EOA Guidance. The technical memorandum should include RAOs to restore groundwater for beneficial use consistent with EPA guidance for groundwater remedies performed under CERCLA. RAOs restricting or limiting pumping for specific off-site uses may be necessary if restoration is proven impracticable but should not be used as the starting point of the analysis. Please see the following EPA guidance:

   - EPA, 1993, Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration, EPA/540-R-93-080.

   - EPA, 1995, Consistent Implementation of the FY 1993 Guidance on Technical Impracticability of Ground-Water Restoration at Superfund Sites, OSWER Directive 9200.4-14, January 19, 1995.

EPA looks forward to scheduling a conference call or meeting at which technical stakeholders can discuss these concepts. Please let me know if you have any questions or concerns.

Best Regards,

David A. Seter, P.E.
Remedial Project Manager
USEPA Region 9
Superfund Division (SFD-8-2)

Attachments: Comments / EPA technical experts Steven Acree and Robert Ford
Comments / EPA's consultant CB&I
Comments / Yerington Paiute Tribe

Technical Memorandum

Review of "Technical Memorandum: Draft Initial Screening of Remedial Alternatives" for Operable Unit 1, December 2015

Contract Number: EP-S9-13-02
Contrast Task Order: #018-RSBD-09GU

Document Control Number: CBI-0488

January 2016

To: Mr. Dante Rodriguez
Project Manager
U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street, SFD-8-2
San Francisco, California 94105

From: Mr. Julian Isham
CB&I Federal Services LLC
4005 Port Chicago Highway, Suite 200
Concord, California 94520

CC: Dr. John McMillan (CB&I Federal Services LLC)

CB&I Federal Services LLC reviewed the December 2, 2015, document entitled T*echnical Memorandum: Draft Initial Screening of Remedial Alternatives* (Initial Screening TM) for Operable Unit 1 (OU-1) of the Yerington Mine Site (Site). This memorandum was prepared by Brown and Caldwell (B&C) for the Atlantic Richfield Company.

1.0 SUMMARY OF INITIAL SCREENING TM

The Initial Screening TM is organized into following five sections:

- Section 1.0, "Introduction"
- Section 2.0, "Physical Setting"
- Section 3.0, "Remedial Objectives and Alternative Development"
- Section 4.0, "Identification and Screening of Technologies"

- References are provided at the end of the document.

The Initial Screening TM provides a focused identification of preliminary remedial action objectives and associated technologies for each known or potential contaminant medium. It is to provide the basis for preliminary scoping discussions with U.S. Environmental Protection Agency (EPA) regarding the OU-1 feasibility study and subsequently the development of the remedial alternatives screening summary. The Initial Screening TM includes the use of a focused Hydrogeologic Conceptual Site Model for OU-1, achievable remedial action alternatives (RAOs), consideration of contaminants of potential concern (COPCs) that are currently anticipated to drive the remedial alternative selection process, and consideration of facilities and/or impacted soils in the operable units that represent past and/or ongoing sources of COPCs to groundwater. Since this is an initial screening of alternatives, the Initial Screening TM focuses on uranium and sulfate as the two key COPC.

The analysis presented in the Initial Screening TM considers the facilities and impacted soils, and other operable units that represent past or ongoing sources of COPCs to groundwater, because integration of the OU-1 remedial investigation/feasibility study (RI/FS) with other operable units is required pursuant to Section 7.0 of the Statement of Work attached to the *Administrative Order for Remedial Investigation and Feasibility Study*. (EPA [2007a] in the references of the Initial Screening TM). These include the Process Area, Evaporation Ponds and Arimetco Facility. It does not consider the Operable Unit 2 Pit Lake or the Wabuska Drain. The Pit Lake is noted to act as a groundwater sink and therefore should not release contaminants into the groundwater. The report indicates that the data for the Wabuska Drain is inconclusive.

The objectives of the Initial Screening TM are stated as follows:

- Provide the basis for preliminary scoping for the OU-1 Feasibility Study (FS),
- Provide context for the development of the OU-1 Remedial Alternatives Screening Summary (RASS) and the scope of a FS Work Plan (or technical memorandum) that will memorialize and describe in detail how the remaining alternatives (i.e., those not screened out) will be further evaluated,
- Integrate a very large amount of groundwater data and related Site information that would be used to develop a remediation strategy for OU-1; and
- Develop consensus among agencies and stakeholders about OU-1 remedial alternatives that are clearly infeasible or inappropriate based on effectiveness, implementability and/or cost.

CB&I's comments follow. CB&I has no comments on Section 1.0.

2.0 COMMENTS ON SECTION 2.0, "SITE DESCRIPTION"

Section 2 provides a moderate level of detail on the physical setting and historical operations at the site. The section also provides information on the Hydrogeologic Conceptual Site Model.

Comment 2.1: *In Section 2.2, flow charts showing the movement of COPCs from and to various historical operations would be useful.*

Comment 2.2: *In Section 2.3, the documents states: "The plume of mine-impacted groundwater is stable, based on an evaluation of changes over time in the estimated volume of mine-impacted groundwater, masses of sulfate and uranium, and the chemical centers-of-mass." This is a very significant assertion, however, no supporting information or reference citations are provided. Such support is needed.*

3.0 COMMENTS ON SECTION 3.0, "REMEDIAL OBJECTIVES AND ALTERNATIVE DEVELOPMENT"

In Sections 3.1 and 3.2, the document develops the concept that it is impractical to restore the aquifer via a pump-and-treat process. B&C developed a set of preliminary RAOs for OU-1. These preliminary RAOs are intended to prevent further migration of the plume and to prevent exposure to the mine-impacted groundwater. These preliminary RAOs include the following:

- Control leaching, infiltration, and migration of COPCs from on-Site sources to reduce/prevent continued sourcing to the alluvial aquifer.
- Manage groundwater withdrawals from agricultural wells at capacities that do not adversely affect plume control.
- Monitor groundwater at selected monitor wells, drinking water wells, and irrigation wells to verify and evaluate plume control and effectiveness of the remedy.

Additional preliminary RAOs associated with the human health risk assessment and the feasibility study may include the following:

- Prevent ingestion of water having carcinogens posing excess risk levels.
- Prevent ingestion of groundwater having non-carcinogen COPCs posing excess risk levels.
- Prevent ingestion and/or direct contact with soils having non-carcinogen COPCs posing excess risk levels.

- Prevent direct contact/ingestion with soil having excess cancer risk from carcinogens.
- Prevent inhalation of carcinogens posing excess risk levels.

Comment 3.1: *An analysis is provided for site-wide treatment. The analysis does not include the effectiveness of treating hot spots in addition to analyzing the technologies for treatment of the complete site. A hot spot could be a geographical area or could be depth specific. An example might be the shallow zone groundwater beneath the unlined evaporation pond where the highest concentrations of COPCs are located. It is recommended that some technologies, as described below, be retained as potentially applicable for hot spot treatments and where the combination of various remedial alternatives may be effective.*

Comment 3.2: *The second equation on page 8 uses the terms "Koc" and "foc" that are typically used in equations to assess the movement of organic compounds, not inorganic compounds. We understand the inorganic assessment they are trying to convey, but there may be a more appropriate equation available, or the coefficient terms in this equation may need to be changed.*

Comment 3.3: *In stating preliminary RAOs for OU-1 at the top of page 9, the criteria that will be used to assess and confirm "plume control" are not defined. Please clarify what these criteria will be.*

In Section 3.4, B&C indicate that a wide spectrum of technologies for reducing uranium and sulfate concentrations in groundwater were identified. Sources for the technology inventory included literature searches and internet remediation technology search tools maintained by the U.S. Department of Energy, EPA and other organizations. These prospective treatment technologies were classified according to "media".

Comment 3.4: *CB&I recommends that the list of references reviewed be provided.*

4.0 COMMENTS ON SECTION 4.0, "IDENTIFICATION AND SCREENING OF TECHNOLOGIES"

Section 4.0 of the Initial Screening TM provides an initial analysis of various remedial alternatives and management approaches to select promising alternatives and approaches to consider for additional analysis.

Comment 4.1: *The overall analysis is forthright but very limited. It focuses on "promising alternatives", but in doing so, restricts too early other possible technologies which might have utility for smaller areas or hot spots (see Comment 3.1 of Section 3*

above). It is recommended that additional technologies be initially considered, to provide for a more complete analysis. A bulleted list of additional remedial alternatives and management approaches for consideration is provided as follows. This list is not intended to be comprehensive, but is offered for broader consideration.

- *Land-use controls with a subset of institutional controls*
  - *Institutional controls*
    - *Zoning*
  - *Physical controls*
    - *Security personnel or cameras*
  - *Providing drinking water to local citizens*
- *Long-term management*
  - *Environmental monitoring*
    - *Soil*
    - *Groundwater*
    - *If any impacted buildings/structures remain on site, monitoring may be needed if a change in use of the structures occurs or if workers are needed to perform tasks inside of the buildings/structures*
  - *Site inspections/reviews*
- *Containment*
  - *Horizontal barriers for soils (horizontal barriers such as clay or synthetic liners are used to contain the vertical migration of contaminants [i.e., a liner placed beneath contaminated soil])*
- *Removal*
  - *Groundwater extraction*
    - *Horizontal wells*
- *Soil Treatment*
  - *Ex Situ*
    - *Stabilization*
      - *External equipment*
      - *In-place*

- *Liquid reagent addition via infiltration ditches or spaying over soil*
- *Liquid or solid addition by placement of a layer of reagent on top of soil and let infiltrate*

- *Vitrification*
- *Soil wash*
- *Thermal*

– *In situ*

- *Vitrification*
- *Electrokinetics*
- *Oxidation-reduction*
- *Solvent extraction and soil flushing*
- *Stabilization*
- *Bioremediation*

- *Groundwater treatment*

– *Ex situ*

- *Absorption*
- *Filtration*

– *In situ*

- *Permeable reactive barriers*
  - *Zero valent iron*
- *Phosphate containing reagent(s)*

Comment 4.2: *Several technologies that are not retained for the sitewide use may be applicable for treatment of localized areas or hotspots. (see Comment 3.1 of Section 3.0 above)*

Comments on Table 4-1 "Initial Screening of Promising Remedial Technologies for Mine Waste and Impacted Soils."

Comment 4.3: *As a general comment, this table seems focused on the diminution of chemical flux from residual source areas to groundwater on a site-wide basis. The limitation of alternatives considered in this initial screening should not restrict the future*

alternatives evaluations of other OUs of the Yerington Site when considered on a more feature-specific basis. .

Comment 4.4: *"Containment" "Horizontal Barrier"-" Stabilization" was not retained for sitewide treatment. Depending on the form of uranium, stabilization/fixation may be applicable for treatment of hotspots that may allow monitored natural attenuation to become more effective. Capping was only assessed using soil, either from an on-site or off-site source. A geosynthetic material should also be considered, as it could also be used to prevent the infiltration of precipitation and could double as a control technology in Table 4-2.*

Comment 4.5: *"Disposal "-"On-Site Disposal": Is this alternative for disposal of the Limited Excavation material? Recommend clarification.*

Comments on Table 4-2 "Initial Screening of Promising Remedial Technologies for On-Site Groundwater".

Comment 4.6: *"Containment"-"Vertical Barriers"-"Barrier Wall": This technology is initially noted to be effective for the shallow zone, but then is dismissed. Considerable industry experience exists for the installation of these walls, some to significant depth. Also, a vertical barrier may combine well with a horizontal barrier over a source area, and hydraulic control within the vertical barrier to aid in the achievement of RAOs. As stated above, "Horizontal Barrier" should be considered in the form of a plastic cover over the evaporation ponds to prevent infiltration of COPCs from the soils.*

Comment 4.7: *"Removal"-"Wells" and "Ex Situ Groundwater Treatment "-"Chemical Treatment ": Lime softening was retained as a technology, though it is noted that this process option is only effective for high concentrations of uranium in secondary waste streams, and also that the resulting waste stream will require further processing. What would the technology be for such processing? Ion exchange and reverse osmosis were noted to be applicable to low concentrations of uranium, and for both it is noted that the uranium solution resulting from resin regeneration will require treatment/disposal. Neither, however, was retained, leaving no considered technologies for low concentration groundwater. Also, does the "resin regeneration" statement really apply to reverse osmosis? Lastly, it would appear that a separate screening of technologies is needed for low concentration groundwater versus high concentration groundwater for the anticipated COPCs, as may result from "hotspot" treatment or selective pumping for the "Hydraulic Containment" technology.*

Comment 4.8: *"In Situ Groundwater Treatment"-"Redox Technologies"-"Various" was not retained. Please provide additional justification for not retaining this technology. The effectiveness of this treatment depends on several factors, for example, the rate of oxygenated water entering into the treated zone and the acceptable release rate of the COPCs back into the groundwater.*

Comment 4.9*: "In Situ Groundwater Treatment"-"Phosphate Precipitation"-"Various" was not retained for sitewide treatment. Consider that this technology may be applicable for treatment of hotspots.*

Comment 4.10: *"Disposal"-"Treated Groundwater": All process options for this technology type are eliminated, leaving no disposal options for treated groundwater. Dismissal of all these technologies seems premature, particularly in light of possible State action to manage groundwater withdrawal. Reinjection may be a potential component of hydraulic control measures, and reuse (should an appropriate user be identified) may be viable.*

Comments on Table 4-3 "Initial Screening of Promising Remedial Technologies for Off-Site Groundwater."

Comment 4.11: *"Removal"-"Groundwater Extraction"-"Wells" was not retained for site-wide treatment. Consider that this technology may be applicable for treatment of hotspots.*

5.0 REFERENCES

Brown and Caldwell, 2015, T*echnical Memorandum: Draft Initial Screening of Remedial Alternatives, December 2.*

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL RISK MANAGEMENT RESEARCH LABORATORY
GROUND WATER AND ECOSYSTEMS RESTORATION DIVISION
PO BOX 1198 • ADA, OK 74821

January 12, 2016

OFFICE OF
RESEARCH AND DEVELOPMENT

MEMORANDUM

SUBJECT: Yerington Mine Site, Yerington, Nevada (16-R09-003)
Draft Initial Screening of Remedial Alternatives

FROM: Steven D. Acree, Hydrologist
Ground Water & Ecosystems Restoration Division
Applied Research and Technical Support Branch
Ada, OK 74820

Robert Ford, Ph.D., Research Environmental Scientist
Land Remediation & Pollution Control Division
Soils & Sediments Management Branch
Cincinnati, OH 45268

TO: David Seter, RPM
USEPA, Region 9, Superfund Division

Per your request for continuing technical support, the referenced document has been reviewed. The document presents an initial framework for screening remedial technologies that potentially are applicable to Operable Unit 1. However, supporting analyses and comprehensive literature reviews to support the conclusions of this screening were not provided. Although the document may serve as a useful starting point for discussions of remedial alternatives, much additional work would be required to provide adequate support for alternatives developed during the feasibility study. The following general comments and recommendations are provided for your consideration.

1. **Plume Stability**

The document states that the plume of mine-impacted groundwater is stable based on evaluations of changes in the estimated volume of contaminated groundwater, sulfate/uranium masses, and chemical center of mass through time. It is recommended that this assessment be supplemented by evaluations of well-specific temporal trends in the concentrations of site-related chemicals, particularly for wells located near the downgradient limits of mine-impacted groundwater. These data may provide a much more sensitive indicator of plume migration than the bulk analyses referenced in the document.

2. **Technical Impracticability of Restoration**

The document uses a simple analytical approach to support the contention that groundwater restoration is impracticable. Although the results of these simple analyses are informative, it is recommended that more detailed analyses, such as estimation of the size and configuration of a remedial system that could potentially meet this remedial objective accompanied by a thorough discussion of the technical difficulties and limitations in implementing such a design, be considered to provide additional perspective.

3. **Table 4-3**

It noted that the general response actions for off-site groundwater did not include containment. This is likely a result of the initial assessment of plume stability discussed above. It is recommended that this response action be reconsidered following a more detailed assessment of plume stability.

4. **Tables 4-1, 4-2, 4-3, 4-4**

These tables, which describe response actions, technologies, and assessments of effectiveness and implementability, may serve as an initial basis for discussions in the feasibility study. However, much additional discussion of pertinent literature and the results of supporting analyses will be needed to fully support remedial decisions and the technical opinions expressed in this document.

If you have any questions regarding these comments, please do not hesitate to contact us at your convenience. We look forward to future interactions with you concerning this and other sites.

cc: Ed Gilbert, (5203P)
Mike Gill, Region 9
Kathy Baylor, Region 9
Glenn Bruck, Region 9
Richard Freitas, Region 9
Herb Levine, Region 9
ZiZi Searles, Region 9

YERINGTON PAIUTE TRIBE
171 Campbell Lane
Yerington, NV 89447
Phone: (775) 463-3301
Fax: (775) 463-2416

January 11, 2016

David Seter
Remedial Project Manager
U.S. EPA Region 9, Superfund
75 Hawthorne Street, SFD-8-2
San Francisco, CA 94105

RE: Yerington Mine Draft Initial Screening of Remedial Alternatives Technical Memorandum

Mr. Seter:

Please find attached our comments regarding the Yerington Mine Draft Initial Screening of Remedial Alternatives Technical Memorandum. We appreciate the opportunity to review this important document and for the assistance from your office in keeping the Tribe involved in the project planning processes.

Although the Tribe is not providing approval of the program, we have concerns regarding the use of VLT materials and the disposal of waste and treated water, and we feel it is important to participate in the process with the hope of providing a positive and constructive environment for stakeholders, regulatory agencies and responsible parties working with the Yerington Mine Site.

If you have any questions or to schedule the follow up meeting and/or conference calls, please feel free to contact Ms. Ginny Hatch, our Environmental Director, at 775.463.7866 or ghatch@ypt-nsn.gov.

These comments are provided for the site record with the intent to improve the interpretation of the existing data collected at the Yerington Mine Site and, if required, suggest alternatives for the proposed investigation. Although the Tribe is not providing approval of the program, we feel it is important to participate in the process with the hope of providing a positive and constructive environment for stakeholders, regulatory agencies and responsible parties working with the Yerington Mine Site.

Sincerely:
YERINGTON PAIUTE TRIBE

Deborah Dunn
Deputy Administrator

YERINGTON PAIUTE TRIBE
171 Campbell Lane
Yerington, NV 89447
Phone: (775) 463-3301
Fax: (775) 463-2416

Specific Comments:

#	Section Page	Comment
1.	2.2.2 4	Although the history and overview should be brief, it appears to be incomplete without describing Atlantic Richfield/BPs role at the site as Post-Anaconda Operations.
2.	2.2.2 4	It should be indicated that subdivisions used to describe the aquifer (shallow, intermediate et cetera) are not based on actually physical features but are a management tool.
3.	2.3 6	The role of agriculture and COPCs in groundwater is not defined and should be described as undefined and/or not quantified. It is unclear from current site data the actual identity and quantity of potential source materials or if those issues are significant to site management.
4.	2.3 6	Additional analysis and/or reference is required to support the statement that "the plume mine-impacted groundwater is stable." Additionally, this statement is contradicted by the following paragraph that states precipitates in the shallow zone "likely represent a potential ongoing source of COPCs to groundwater."
5.	3.2 8	Exposure to COPCs through the use of plants and animals should be discussed in this section. Additionally, the exposure pathway for respirable dust should also be discussed as impacted particulates from surface use of contaminated groundwater is additional potential risk. These may be an RAO or more directly linked to an RAO.
6.	3.2 9	See General Comment 15.
7.	Table 4-1	The use of VLT has been limited at the site for a number of reasons including uranium mobility. It is likely not a practical material for use in future capping efforts.
8.	Table 4-1	Although other non-VLT material may be available onsite and be more appropriate, there is a higher probability that more offsite material will be needed. The larger volume can be permitted and, as indicated by the haul road to MacArthur mine, transportable locally. Fill and cap constructed entirely with off-Site material is technically implementable as indicated by the very large volume of offsite material already on the site and the existing infrastructure used to transport it to the site. Fill and cap constructed entirely with off-Site should be carried for Further Evaluation.
9.	Table 4-1	A combination on and off site disposal is already occurring and should be retained as a process option. This was important to removing TNORM waste which had an appropriate off-site disposal location.
10.	Table 4-2	Removal /wells may be practical combined with hydraulic containment or only applied in key areas (limited application). This should be retained for further evaluation.

Document: Yerington Mine Draft Initial Screening of Remedial Alternatives Technical Memorandum

Reviewer: Yerington Paiute Tribe

Specific Comments (Continued):

#	Section Page	Comment
11.	Table 4-2	Disposal of treated water can be a component of the final remedy if less contaminated water is used as part of hydraulic containment or removal. All four process options for Disposal should be Retained for Further Evaluation.
12.	Table 4-3	A partial removal system may be required to protect sensitive targets such as municipal and agricultural wells. Removal/containment near the northern end of the plume would benefit the protection of Tribal water resources for example.
13.	Table 4-4	Changes suggested in Tables 4-1 through 4-3 should be included as part of the summary provided in Table 4-4.

General Comments:

1. The claim that Pit Lake is not considered a source of COPCs should be reviewed. Given the trend of extreme weather conditions creating less predictable water availability scenarios, it is worth reviewing this claim. For example, this year, the Walker River ran dry which likely impacted the effect of the river as a hydraulic barrier.

2. The impact of agricultural activities on groundwater has been discussed intermittently during technical meetings; however, we disagree with the statement: "an assessment of background groundwater quality (BC, 2015a) identified the extent of mine-impacted groundwater and an area of groundwater in the northern part of the Study Area that has been impacted by agricultural activities rather than mining activities." Agricultural water use to the north of the study area includes use of wells within the contaminated aquifer; thereby, this water is mine impacted and the impacts should be treated as such.

   Additionally, agricultural use restrictions discussed in Section 3.2 as a preliminary RAO instituted should be considered as interim actions. Domestic well restrictions in the area have already been established by the state, and given the risk to plume mobility and exposure to contaminated groundwater, including through plant and animal uptake, these restriction would likely have an immediate impact on exposure risk and plume migration.

3. Although the extent of groundwater impacted by the mobile, mine-related COPCs (Uranium and sulfate) are significant in the determination of the extent of contamination, the other COPCs may pose a greater human health and/or environmental risk (e.g. selenium) and will require attention during the remediation design.